

Organisms from all kingdoms possess a set of instructions (_____) that determine their characteristics. These instructions are passed from _____ to offspring during reproduction.

The inherited instructions that are passed from parent to offspring exist in the form of a code. This code is contained in _____ molecules.

The DNA molecules must be accurately replicated before being passed on. Once the coded information is passed on, it is used by a cell to make _____. The proteins that are made become cell parts and carry out most functions of the cell.

Throughout recorded history, humans have used selective _____ and other methods to produce organisms with desirable traits. Our current understanding of DNA allows for the manipulation of genes and the development of new combinations of traits and new varieties of organisms.

The characteristics of an organism can be described in terms of combinations of traits. Traits are inherited, but their expression can be modified by interactions with the _____.

Provide examples of how environment interacts with heredity

Every organism requires a set of coded instructions for specifying its traits. For offspring to resemble their parents, there must be a reliable way to transfer information from one generation to the next. Heredity is the passage of these instructions from one generation to _____.

What are these coded instructions called and where are they found?

Hereditary information is contained in genes, located in the _____ of each cell. Each gene carries a separate piece of information. An inherited trait of an individual can be determined by one or by _____ genes, and a single gene can influence _____ than one trait. A human cell contains many thousands of different _____.

Provide some examples of traits influenced by more than one gene.

In asexually reproducing organisms, all the genes come from a _____ parent. Asexually produced offspring are normally genetically identical to the parent.

How does asexual reproduction resemble a cloned organism?

In _____ reproducing organisms, the new individual receives half of the genetic information from its _____ (via the egg) and half from its _____ (via the sperm). Sexually produced offspring resemble, but are not _____ to, either of their parents.

Show half of the characteristics from Mom and half from Dad with a punnett square

State and Explain Two Reasons Sexually Reproduced Offspring Do NOT Resemble their Parents

a.)

b.)

Genes are segments of DNA molecules. Random alteration of DNA can cause _____ An altered gene may be _____ on to every cell that develops from it.

What is a mutation?

What are the only kinds of mutations which can be passed on to the offspring?

In all organisms, the coded instructions for specifying the characteristics of the organism are carried in DNA, a large molecule formed from subunits of four kinds (represented by _____). The chemical and structural properties of DNA are the basis for how the genetic information that underlies heredity is both encoded in genes (as a string of molecular "letters") and replicated by means of a _____.

Each chromosome has hundreds or thousands of _____.

Each gene codes for a particular protein.

DNA is made of 4 bases: ATCG.

A three letter _____ represents a specific amino acid. These amino acids are assembled into _____.

Possible base pairs: A-T and C-G (in RNA, A-_____ and C-G)

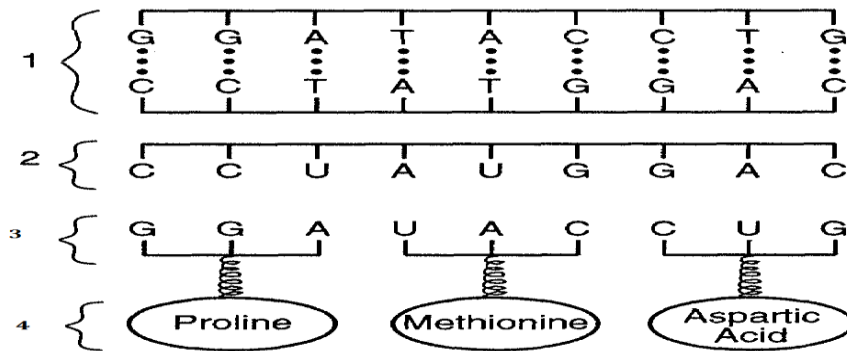
What is a template?

Cells store and use coded information. The genetic information stored in DNA is used to direct the synthesis of the thousands of _____ that each cell requires.

What is the central dogma of biology?

The work of the cell is carried out by the many different types of molecules it assembles, mostly _____. Protein molecules are long, usually folded chains made from _____ different kinds of _____ in a specific sequence. This sequence influences the shape of the protein. The shape of the protein, in turn, determines its _____.

Identify 1-4 in the diagram below.



Provide three examples where the shape of a protein determines its function.

Offspring resemble their parents because they inherit similar _____ that code for the production of _____ that form similar structures and perform similar _____.

Why do relatives more removed from you look and act different?

1.

2.

Cell functions are regulated. Regulation occurs both through changes in the activity of _____ and through the selective expression of individual genes. This regulation allows cells to respond to their _____ and to control and coordinate cell growth and division.

Some genes are turned _____ and _____ depending on which cell is involved, even though all cells in an organism have the same _____.

The many body cells in an individual can be very different from one another, even though they are all descended from a single cell and thus have essentially identical genetic instructions. **This is because _____ parts of these instructions are used in different types of cells, influenced by the cell's _____ and past history.**

For thousands of years new varieties of cultivated plants and domestic animals have resulted from _____ breeding for particular traits.

How does selective breeding differ from genetic engineering? How long has each been around?

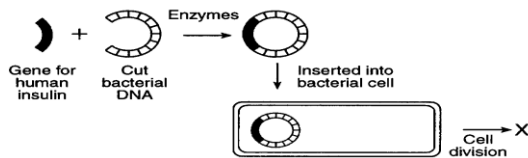
In recent years new varieties of farm plants and animals have been engineered by _____ their genetic instructions to produce new characteristics.

What is recombinant DNA? (genetic engineering)

Different _____ can be used to cut, copy (clone), and move segments of DNA. Characteristics produced by the segments of DNA may be expressed when these segments are inserted into new organisms, such as _____.

What do restriction enzymes do?

How can we make bacteria produce human insulin?



Define the following mutation types:

Insertion

Deletion

Substitution

Provide two specific examples where genetic engineering has aided human health.

- 1.
- 2.